HELMINTHS IN *MESASPIS MONTICOLA* (SQUAMATA: ANGUIDAE) FROM COSTA RICA, WITH THE DESCRIPTION OF A NEW SPECIES OF *ENTOMELAS* (NEMATODA: RHABDIASIDAE) AND A NEW SPECIES OF *SKRJABINODON* (NEMATODA: PHARYNGODONIDAE)

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Summary:

Entomelas duellmani n. sp. (Rhabditida: Rhabdiasidae) from the lungs and *Skrjabinodon cartagoensis* n. sp. (Oxyurida: Pharyngodonidae) from the intestines of *Mesaspis monticola* (Sauria: Anguidae) are described and illustrated. *E. duellmani* is the sixth species assigned to the genus and is the third species described from the Western Hemisphere. It is easily separated from other neotropical species in the genus by pre-equatorial position of its vulva. *Skrjabinodon cartagoensis* is the 24th species assigned to the genus and differs from other neotropical species in the genus by female tail morphology.

KEY WORDS : Nematoda, *Entomelas*, Rhabdiasidae, *Skrjabinodon*, Pharyngodonidae, new taxa, *Mesaspis monticola*, Anguidae, Costa Rica.

Résumé : HELMINTHES CHEZ *MESASPIS MONTICOLA* (SQUAMATA: ANGUIDAE) AU COSTA RICA, AVEC LA DESCRIPTION D'UNE NOUVELLE ESPÈCE D'*ENTOMELAS* (NEMATODA: RHABDIASIDAE), ET DUNE NOUVELLE ESPÈCE DE *SKRJABINODON* (NEMATODA: PHARYNGODONIDAE)

Entomelas duellmani *n. sp. (Rhabditida: Rhabdiasidae) des poumons et* Skrjabinodon cartagoensis *n. sp. (Oxyurida: Pharyngodonidae) des intestins de* Mesaspis monticola *(Sauria: Anguidae) sont décrits et illustrés.* Entomelas duellmani *est la sixième espèce assignée au genre et est la troisième espèce décrite de l'hémisphère occidental. Elle se distingue facilement des autres espèces néotropicales par la position pré-équatoriale de la vulve.* Skrjabinodon cartagoensis *est la 24e espèce assignée au genre et diffère des autres espèces néotropicales du genre par la morphologie de la queue de la femelle.*

MOTS CLÉS : *Nematoda,* Entomelas, *Rhabdiasidae,* Skrjabinodon, *Pharyngodonidae, nouveau taxa,* Mesaspis monticola, *Anguidae, Costa Rica.*

INTRODUCTION

Mesaspis monticola (Cope, 1877) occurs at elevations of 1,800-3,800 m in humid areas of montane and subalpine forests of the cordilleras of Costa Rica and extreme western Panama (Savage, 2002). To our knowledge, no helminths have been reported from this species. Five species of *Entomelas* Travassos, 1930 are currently recognized, two from the Western Hemisphere (Table I); 23 species of *Skrjabinodon* Inglis, 1968 are currently recognized, four from the Western Hemisphere (Table II). The purpose of this paper is to describe the sixth species assigned to *Entomelas*, the twenty-fourth species assigned to *Skrjabinodon*, and to provide the initial helminth list for *M. monticola*.

MATERIALS AND METHODS

Sixteen *Mesaspis monticola* were borrowed from the herpetology collection of the Los Angeles County Museum of Natural History (LACM 148210, 148226, 148234, 148266, 148273, 148279, 148287, 148288, 148290-148296, 148305) and examined for helminths. The lizards had been collected in Cartago Province, Costa Rica between May 1959 and July 1963 and were originally fixed in 10 % formalin, then stored in 70 % ethanol. The abdominal cavity of each lizard was opened and the gastrointestinal tract was removed, opened longitudinally, and searched for helminths using a dissecting microscope. The coelom, lungs and bladder were also searched. Each helminth (fixed *in situ*) was cleared in glycerol on a glass slide and identified with a light microscope. Illustrations were made with the aid of a microprojector. Measurements given in micrometers unless otherwise indicated as mean and ± 1 SD with range in parentheses.

RESULTS

Twelve of 16 (75 %) lizards were found to harbor helminths: five species of Nematoda, *Cosmocercoides variabilis* (Harwood, 1930), a new species of *Entomelas*, *Oswaldocruzia* sp., *Physaloptera retusa* Rudolphi, 1819, a new species of *Skrjabinodon*, and one species of Acanthocephala, cystacanths assignable to the family Oligacanthorhynchidae. Site of infection, number found, prevalence, abundance, mean intensity, range, and accession numbers for these helminths are given in Table III.

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Realm *Entomelas* sp.	Type host	Length (mm)	Esophagus as % of body length (variation)	Vulva location (as % of length from anterior)	Tail as % of length (variation)	Tail terminus	Reference
Ethiopian							
E. sylvestris Baker, 1982	*Breviceps sylvestris*	5.2-16.2	7.4 (5.7-12.4)	post equatorial (56-65)	3.0 (2.4-4.2)	sharp point	Baker, 1982
Neotropical							
E. campbelli Martínez-Salazar & León-Régagnon, 2005	*Mesaspis gadovii*	3.8-5.7	9.4 (9.3-9.8)	equatorial (48-51)	5.1 (4.5-5.6)	sharp point	Martínez-Salazar & León-Régagnon, 2005
E. duellmani n. sp.	*Mesaspis monticola*	2.8-3.3	13.5 (13.2-13.9)	pre-equatorial (47-48)	7.6 (6.7-8.3)	blunt point	this report
E. floresvillelai Martínez-Salazar & León-Régagnon, 2005	*Barisia imbricata*	5.1-6.3	11.8 (10.8-11.9)	equatorial (50-53)	5.1 (5.0-5.3)	blunt point	Martínez-Salazar & León-Régagnon, 2005
Oriental							
E. cruszi Baker, 1980	*Otocryptis wiegmanni*	6.3-19.5	7.3 (6.0-10.2)	post equatorial (55-69)	2.2 (1.9-3.1)	sharp point	Baker, 1980
Palaearctic							
E. entomelas (Dujardin, 1845) Travassos, 1930	*Ophisaurus apodus*	3.8-10.3	11.9 (9.3-12.0)	post equatorial (59-64)	4.8 (4.5-5.1)	sharp point	Baker, 1980

= *Angiostoma entomelas* Dujardin, 1845)
= *Angiostoma macrostomum* Linstow, 1875
= *Angiostoma dujardini* Maupas, 1916
= *Hexadontophorus ophisauri* Krein, 1940
= *Entomelas kazachstanika* Sharpilo & Vakker, 1972

Table I. Geographic distribution and selected characters of species of Entomelas.

DESCRIPTIONS

ENTOMELAS DUELLMANI N. SP. (Figs 1-6)

Diagnosis (gravid parthenogenic females): Rhabditida, Rhabdiasidae Railliet, 1915, *Entomelas* Travassos, 1930. Truncate anterior extremity, mouth round, lips absent. Large, subspherical buccal cavity with dense cuticular walls of uniform thickness; onchia present on posterior wall. Esophagus club shaped. Amphidelphic.

Holotype parthenogenic female: slender worm, amber in color, with truncate anterior extremity containing obvious, large buccal cavity and conical posterior extremity. Length 3.1 mm, width at vulva 175. Buccal cavity subspherical in lateral view, 35 wide, 27 deep, continuing as a conical depression into anterior portion of esophagus. Anterior wall of buccal cavity thin, surrounding round mouth, 22 in diameter, and supporting two dorsal, two ventral low cuticular papillae and two lateral amphids. Lateral and posterior walls of buccal cavity of even thickness, heavily sclerotized; sclerotized tissue continuing into muscular portion of esophagus. Posterior wall of buccal cavity with six onchia, four in length. Esophagus club-shaped, 460 in length, 75 at greatest diameter; anterior muscular portion 210 in length, posterior glandular portion 260 in length. Nerve ring, deirids, and excretory pore, 237, 253, and 281 from anterior end, respectively. Vulva, pre-equatorial, salient, 1.50 mm from anterior end (48 % of body length). Vagina a short flattened cavity. Uteri amphidelphic. Oviducts short; ovaries long, folding back over uteri. Eggs few in number, 61 ± 7 (54-72) long, 35 ± 4 (30-42) wide, uncleaved. Tail 275 long, conical, tapering to a blunt end.

Paratype parthenogenic females: length 2.96 ± 0.15 mm (2.82-3.33 mm), width at vulva 151± 14 (138-175). Buccal cavity 35 ± 3 (30-39) wide, 23 ± 3 (18-27) deep; onchia, 3-6 in length. Esophagus club-shaped, 430 ± 31 (375-463) in length, 66 ± 7 (54-75) at greatest diameter; anterior muscular portion 204 ± 19 (175-238) in length, posterior glandular portion 226 ± 30 (175-275) in length. Nerve ring, deirids, and excretory pore, 216 ± 19 (187-250), 232 ± 26 (206-293, and 270 ± 19 (241-304) from anterior end, respectively. Vulva 1.42 ± 0.08 (1.34-1.60) from anterior end (48 % of body length). Eggs few in number, 61 ± 7 (54-72) long, 35 ± 4 (30-42) wide, uncleaved. Tail 226 ± 29 (188-275) long, conical, tapering to a blunt end.

TAXONOMIC SUMMARY

Type host: *Mesaspis monticola* (Cope, 1877); symbiotype, LACM 148226, collected 21 May 1959.
Type locality: Volcán Irazú (9° 58' N, 83° 52' W), Cartago Province, Costa Rica.
Site of infection: lung.

Realm *Skrjabinodon* sp.	Male			Female		Reference
	Papillae pattern*	Spicule (µm)	Tail surface	Egg	Tail shape, surface	
Australian						
S. leristae Mawson, 1971	2-2-2	absent	spined	poles unadorned	filiform, spined	Mawson, 1971
S. oedurae (Johnston & Mawson, 1947) Inglis, 1968	2-2-2	110	12-15 spines	poles unadorned	filiform, 16 spines	Johnston & Mawson, 1947
S. parasmythi Mawson, 1971	2-2-2	60-65	spined	not stated	filiform, spined	Mawson, 1971
S. piankai Bursey & Goldberg, 1999	2-2-2	51-57	0-2 spines	poles flattened	filiform, 4-7 spines	Bursey & Goldberg, 1999
S. poicilandri Ainsworth, 1990	2-3-2	absent	21-33 spines	poles unadorned	filiform, 30-38 spines	Ainsworth, 1990
S. smythi Angel & Mawson, 1968	2-2-2	absent	a few spines	knob, each pole	filiform, 7-9 spines	Angel & Mawson, 1968
S. trimorphi Ainsworth, 1990	2-3-2	absent	3-8 spines	poles unadorned	long spike, 16-24 spines	Ainsworth, 1990
Ethiopian						
S. dossae (Caballero, 1968) Schmidt & Kuntz, 1972	2-2-2	absent	smooth	knob, one pole	filiform, spined	Caballero, 1968
S. mabuyae (Sandground, 1936) Inglis, 1968	2-3-2	85-90	smooth	flattened poles	filiform, smooth	Hering-Hagenbeck *et al.*, 2002
S. mabuiensis (Malan, 1939) Inglis, 1968	2-2-2	absent	smooth	knob, each pole	long spike, smooth	Malan, 1939
S. megalocerca (Scrjabin, 1916) Inglis, 1968	2-2-2	absent	smooth	poles unadorned	filiform, smooth	Scrjabin, 1916
S. ovocaudatus (Caballero, 1968) Schmidt & Kuntz, 1972	2-2-2	absent	smooth	one pole elongate	filiform, spined	Caballero, 1968
Nearctic						
S. cricosaurae Barus & Coy Otero, 1974	2-2-2	37	smooth	flattened poles	filiform, 3-7 spines	Barus & Coy-Otero, 1974
Neotropical						
S. beliocostai Vicente, Vrcibradic, Muniz-Pereira & Pinto, 2000	2-2-2	absent	smooth	poles unadorned	filiform, spined	Vicente *et al.*, 2000
S. scelopori (Caballero, 1938) Inglis, 1968	2-4-2	57	smooth	knob, each pole	filiform, 12-14 spines	Moravec *et al.*, 1997
S. spinosulus Vicente, Vrcibradic, Rocha & Pinto, 2002	2-2-2	43-50	smooth	poles unadorned	filiform,70-80 spines	Vicente *et al.*, 2002
S. cartagoensis n. sp.	2-2-2	72-78	smooth	poles unadorned	stiff spike	this report
Oriental						
S. apapillosus (Koo, 1938) Inglis, 1968	0-0-0	absent	3 spines	knob, each pole	filiform, 70-90 spines	Koo, 1938
Palaearctic						
S. alcaraziensis Lafuente & Roca, 1995	2-3-2	48-56	smooth	poles unadorned	filiform, 7-10 spines	Lafuente & Roca, 1995
S. canariensis (Solera-Puertas, Zapatero-Ramos, Castano-Fernandez, & Carrera-Moro, 1987) Hornero & Roca, 1992	2-3-2	60	smooth	poles unadorned	spike, spined	Solera-Puertas *et al.*, 1987
S. mascomai Roca, 1985	2-2-2	64	smooth	knob, each pole	filiform, smooth	Roca, 1985
S. medinae (Calvente, 1948) Specian & Ubelaker, 1974	2-4-2	54-80	smooth	poles unadorned	filiform, 3-7 spines	Hornero & Roca, 1992
S. pigmentatus (Markov & Bogdanov, 1961) Barus & Coy Otero, 1974	2-2-2	absent	smooth	poles unadorned	filiform, smooth	Markov & Bogdanov, 1961
S. schikhobalovi (Annayev, 1973) Sharpilo, 1976	2-2-2	67	smooth	poles unadorned	filiform, smooth	Annayev, 1973

* Precloacal-postcloacal-base of tail.

Table II. – Geographic distribution and selected characters of species of *Skrjabinodon*.

	Site of infection	Number	Prevalence (%)	Density		USNPC Accession no.
				Mean ± SD	Range	
Nematoda						
Cosmocercoides variabilis	Stomach	1	6	1	–	94909
Entomelas duellmani n. sp.	Lung	59	31	11.8 ± 9.6	2-24	94910
Oswaldocruzia sp.	Small intestine	1	6	1	–	94911
Physaloptera retusa	Stomach	23	31	4.6 ± 3.5	1-10	94912
Skrjabinodon cartagoensis n. sp.	Small, large intestines	38	4	9.5 ± 1.9	8-12	94913
Acanthocephala						
cystacanths	Coelom	12	6	12	–	94914

Table III. – Site of infection, number of individuals, prevalence, abundance, mean and range of infection for six species of helminths in *Mesaspis monticola*.

Type specimens: holotype, parthenogenic female, United States National Parasite Collection (USNPC), Beltsville, Maryland, USNPC 94904; paratypes, USNPC 94905.

Etymology: the species is named for William E. Duellman, University of Kansas, Lawrence, Kansas, in recognition of his lifetime of study of Neotropical amphibians and reptiles.

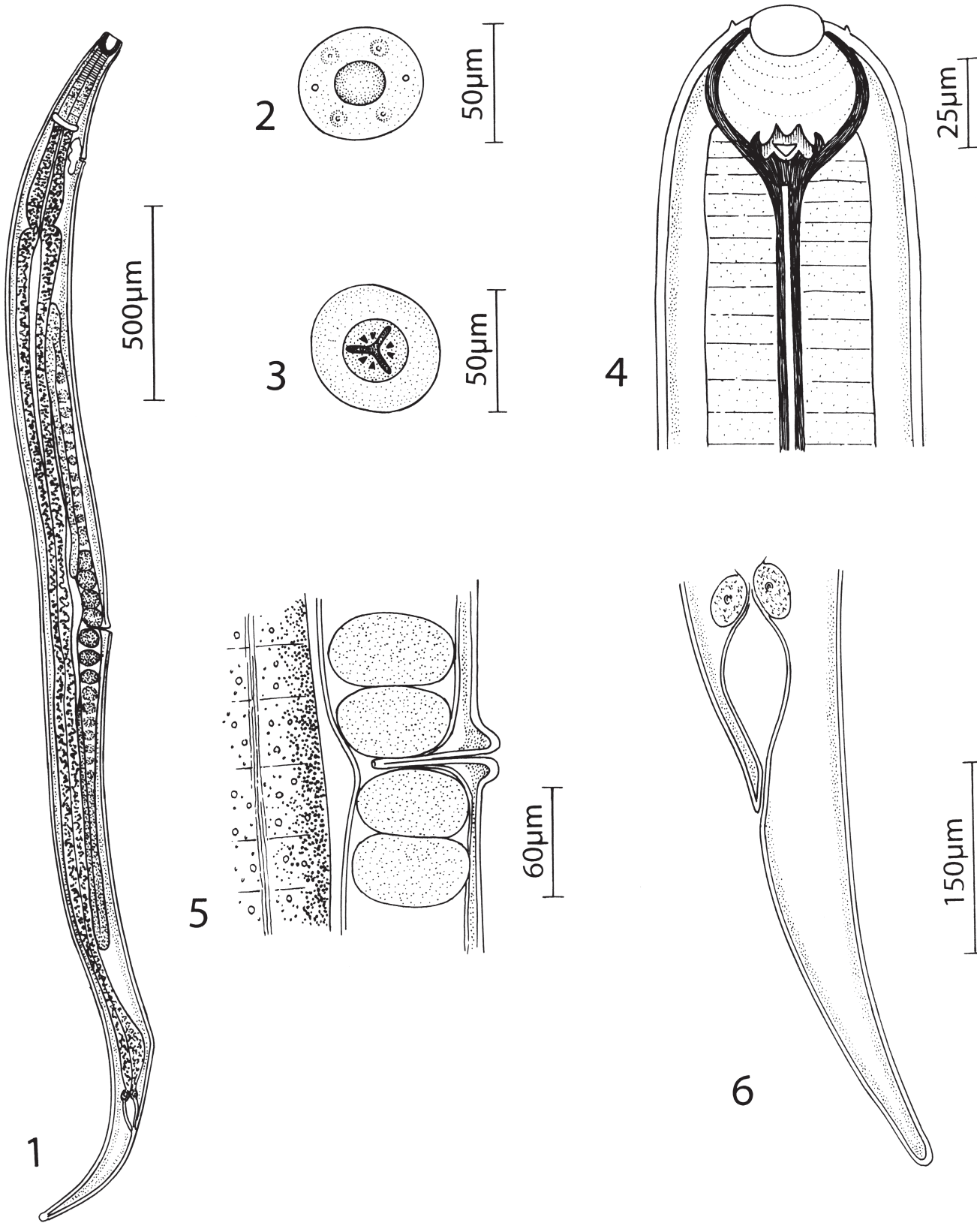
REMARKS

Baker (1980) redescribed *Entomelas entomelas* (Dujardin, 1845) Travassos, 1930 based on specimens from the European anguid lizards *Anguis fragilis* Linnaeus, 1758 and *Pseudopodus apodus* (Pallas, 1775) and synonymized *E. dujardini* (Maupas, 1916) Travassos, 1930, *Entomelas kazachstanika* Sharpilo & Vakker, 1972 and *Hexadontophorus ophisauri* Kreis, 1939 with *E. entomelas*. In the same paper, Baker (1980) described *E. cruzia* from specimens taken from the agamid lizards *Otocryptis wiegmanni* Wagler, 1830 and *Calotes nigrilabris* Ota & Hikida, 1991 collected in Sri Lanka and also reassigned *Kurilonema markovi* Szczerbak & Sharpilo, 1969 to *Entomelas* stating that the lack of onchia was an insufficient reason to erect a genus. Later, Baker (1982) described *E. sylvestris* Baker, 1982 from specimens in the microhylid frog *Breviceps sylvestris* FitzSimons, 1930 collected in South Africa. More recently, Martínez-Salazar & León-Régagnon (2005) described two additional species *Entomelas campbelli* Martínez-Salazar & León-Régagnon, 2005 from the lungs of the anugid lizards *Mesaspis gadovii* (Boulenger, 1913) and *Barisia imbricata* (Wiegmann, 1828) and *Entomelas floresvillelai* Martínez-Salazar & León-Régagnon, 2005 from the lungs of *B. imbricata, Barisia herrerae* Zaldivar-Riveron & Nieto-Montes de Oca, 2002 and *Mesaspis viridiflava* (Boucourt, 1873), all from Mexico, to bring the number of recognized species to five. Kuzmin & Sharpilo (2002) redescribed *Kurilonema markovi* from specimens taken from the scincid lizard *Plestiodon latiscutatus* Hallowell, 1861 collected on Kunashir Island, Kuril Archipelago, Russia, and in disagreement with Baker's (1980) reassignment reestablished the original designation. The key character for assigning the species by Kuzmin & Sharpilo (2002) to the genus *Kurilonema* was the presence of a large subspherical buccal cavity with dense walls of uniform thickness, onchia absent. *Entomelas duellmani* n. sp. does possess onchia on the posterior wall of the buccal cavity and this character along with the presence of a large subspherical buccal cavity with dense walls of uniform thickness allows its assignment to *Entomelas*. *Entomelas duellmani* n. sp., the sixth species assigned to the genus and the third from the Western Hemisphere, is separated from the other species (Table I) by location of vulva, number of cephalic papillae, and shape of tail.

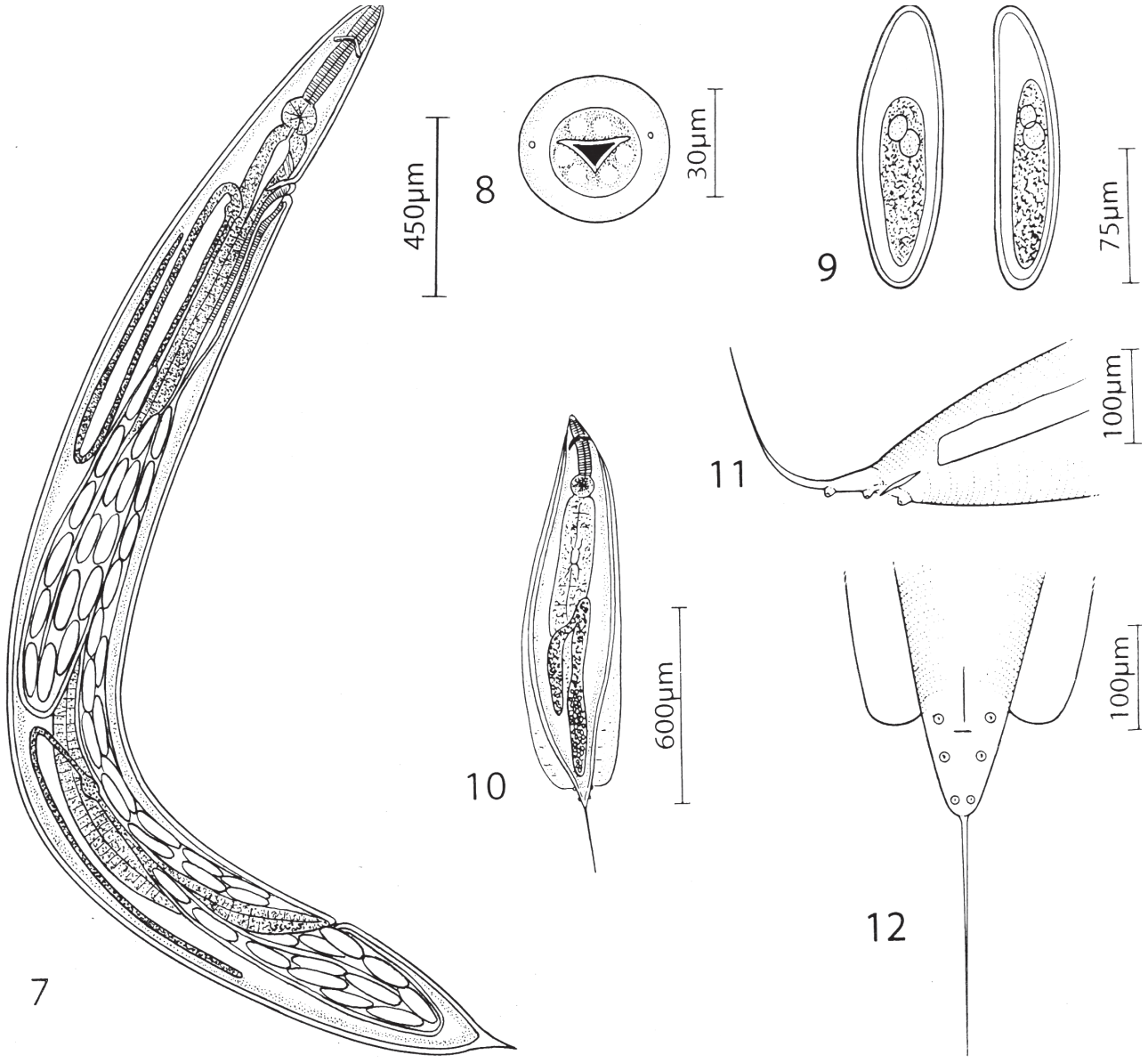
SKRJABINODON CARTAGOENSIS N. SP. (Figs 7-12)

Diagnosis: Oxyurida: Pharyngodonidae Travassos, 1919, *Skrjabinodon* Inglis, 1968. Small, white, cylindrical nematodes with tapering extremities. Cuticle with fine transverse striation along entire body. Mouth bounded by three lips, each with two low papillae, prominent lateral amphids present. Lateral alae present in males, absent in females. Female excretory pore and vulva posterior to esophageal bulb. In males, caudal alae absent, paired caudal papillae present.

Holotype male: length 1.2 mm, excluding filiform tail; width at level of excretory pore 220. Esophageal corpus 141, isthmus 28, bulb 48 in length, 54 in width. Nerve ring 123 and excretory pore 460 from anterior end, respectively. Lateral alae beginning midway between lips and nerve ring becoming approximately 30 in width before terminating slightly anterior to first pair of caudal papillae. Spicule 72 in length. Cloaca and associated papillae slightly raised from body surface but not on distinct cone. Cloacal lips smooth and unadorned. Caudal alae absent, three pairs of sessile papillae, one pair precloacal, one pair postcloacal, third pair occurring on base of tail filament. Third pair of caudal papillae 54 posterior to postcloacal pair. Smooth filiform tail filament extending 240 beyond third pair of



Figs 1-6. – *Entomelas duellmani* n. sp. Fig. 1: Parthenogenic female, entire, lateral view. Fig. 2: Parthenogenic female, en face view. Fig. 3: Optical section, posterior surface of buccal cavity. Fig. 4: Parthenogenic female, anterior end, dorsal view. Fig. 5: Vulvar region, lateral view. Fig. 6: Parthenogenic female, posterior end, lateral view.



Figs 7-12. – *Skrjabinodon cartagoensis* n. sp. Fig. 7: Female, entire, lateral view. Fig. 8: Female, en face view. Fig. 9: Eggs. Fig. 10: Male, entire, ventral view. Fig. 11: Male, posterior end, lateral view. Fig. 12: Male, posterior end, ventral view. Scale bar values are given in µm.

caudal papillae. Single tubular testis reflexed posterior to excretory pore.

Paratype male (2): length 1.20 ± 0.06 mm (1.15-1.28 mm); width at level of excretory pore 216 ± 14 (200-225). Esophageal corpus 134 ± 7 (126-141), isthmus 28 ± 2 (27-30), bulb 45 ± 5 (39-48) in length, 51 ± 3 (48-54) in width. Nerve ring 120 ± 6 (114-123) and excretory pore 454 ± 18 (438-475) from anterior end, respectively. Spicule 76 ± 3 (72-78). Third pair of caudal papillae 57 ± 3 (54-60) posterior to postcloacal pair. Tail filament extending 274 ± 36 (240-312) beyond third pair of caudal papillae.

Allotype female: length 3.8 mm, width at level of vulva 255. Esophageal corpus 270, isthmus 30, bulb 75 long, 82 wide. Nerve ring 120, excretory pore 510, vulva 555 from anterior end, respectively. Thick walled muscular ovijector extending approximately 375, continuing as thin-walled vagina 150 in length before joining two uteri, one directed anteriorly and the other posteriorly. Uterus and ovarian coils reflexed in vulvar region. Eggs elongate ovoid, 152 in length, 36 wide, poles unadorned. Development to morula stage at deposition. Anus 555 from posterior end, the terminal region of the body developed as a stiff spike 120 in length.

Paratype female (allotype 9): length 4.93 ± 1.00 mm (3.71-6.40), width at level of vulva 295 ± 24 (250-325). Esophageal corpus 250 ± 14 (228-270), isthmus 33 ± 4

(24-36), bulb 74 ± 6 (60-81) long, 79 ± 5 (72-90) wide. Nerve ring 110 ± 10 (90-120), excretory pore 518 ± 107 (450-750), vulva 560 ± 113 (450-800) from anterior end, respectively. Eggs 152 ± 3 (147-156) in length, 34 ± 2 (30-36) wide, poles unadorned. Anus 750 ± 91 (550-875) from posterior end, the terminal region of the body developed as a stiff spike 142 ± 23 (120-175) in length.

TAXONOMIC SUMMARY

Type host: *Mesaspis monticola* (Cope, 1877); symbiotype, LACM 148226, collected 21 May 1959.
Type locality: Volcán Irazú (9° 58' N, 83° 52' W), Cartago Province, Costa Rica.
Site of infection: intestine.
Type specimens: holotype male, USNPC 94906; allotype female, USNPC 94907; paratypes, two male, nine female, USNPC 94908.
Etymology: the new species is named after its locality of occurrence, Cartago Province, Costa Rica.

REMARKS

Skrjabinodon species are common parasites found in the intestines of various lizards (Table II). *Skrjabinodon cartagoensis* belongs to the group of species in which males possess a spicule and smooth tail filament, namely, *S. alcaraziensis, S. canariensis, S. cricosaurae, S. mabuyae, S. mascomai, S. medinae, S. scelopori, S. chikhobalovi* and *S. spinosulus*. Of these, females of *S. cricosaurae* and *S. mabuyae* have eggs with truncated poles; *S. mascomai* and *S. scelopori* have eggs with knobs at each pole; *S. alcaraziensis, S. canariensis, S. cartagoensis, S. medinae, S. schikhobalovi* and *S. spinosulus* have elongate eggs with unadorned poles. Females of *S. alcaraziensis, S. medinae* and *S. spinosulus* have filiform tails; *S. schikhobalovi* has a long inflexible tail, *S. canariensis* a short, spined tail spike, and *S. cartagoensis* has a short smooth spike.

DISCUSSION

With the exception of *E. duellmani* n. sp. and *S. cartagoensis* n. sp., none of the helminths found in this study (Table III) was unique to *M. monticola*. *Mesaspis monticola* is a newly recognized host for *Physaloptera retusa* and acanthocephalan cystacanths; the status of *Cosmocercoides variabilis* and *Oswaldocruzia* sp. is more problematic.
Cosmocercoides variabilis has been reported from salamanders, frogs, lizards, snakes and turtles (McAllister & Bursey, 2004). Some uncertainty exists for its hosts because of confusion between *C. variabilis* and *C. dukae*, a molluscan parasite. Vanderburgh & Anderson (1987) demonstrated that the two species are distinct: the major difference in morphology for the two species is the number of rosette papillae in the male, *C. dukae* with 12 pairs, *C. variabilis* with 14 to 20 pairs. The single male specimen found in this study was assigned to *C. variabilis* because it possessed 16 pairs of rosette papillae. Previous reports indicate the typical location for *C. variabilis* to be the intestine, most often the large intestine. Because the single specimen of *C. variabilis* found was in the stomach and because *M. monticola* is known to eat juvenile salamanders (Savage, 2002), we are reluctant to consider *M. monticola* a host for *C. variabilis*. Until more data becomes available, we are inclined to consider this occurrence to be an artifact of diet.
Because we had only the posterior half of a male *Oswaldocruzia*, Type II bursa, it was not possible to assign it to a species. Of the 22 Neotropical species of *Oswaldocruzia* (Ben Slimane *et al.,* 1996; Bursey & Goldberg, 2004), nine have a Type II bursa: *O. bonsi* Ben Slimane & Durette-Desset, 1993 from plethodontid salamanders of Ecuador; *O. dlouhyi* Ben Slimane & Durette-Desset, 1995, from bufonids of Brazil; *O. lescurei* Ben Slimane & Durette-Desset, 1996, from bufonids of Guyana; *O. mazzai* Travassos, 1935 from bufonids of Brazil and Ecuador; *O. peruensis* Ben Slimane, Verhaagh & Durette-Desset, 1995, from iguanid lizards of Peru; *O. proencai* Ben Slimane & Durette-Desset, 1995, from bufonid and leptodactylid anurans of Paraguay; *O. touzeti* Ben Slimane & Durette-Desset, 1993, from leptodactylids of Ecuador; *O. vaucheri* Ben Slimane & Durette-Desset, 1993 from leptodactylids of Ecuador; and *O. venezuelensis* Ben Slimane, Guerrero & Durette-Desset, 1996, from bufonids of Venezuela. Of the nine species listed above, only *O. peruensis* has been reported from lizards, thus we are inclined to also consider the presence of this helminth as an artifact of diet.
Physaloptera retusa is a common lizard stomach worm; Bursey *et al.* (2005) have listed 55 hosts for the species. To that list, *M. monticola* should be added. Species of *Physaloptera* have an indirect life cycle, infection is attained by the injection of infected insects (Anderson, 2000).
Oligacanthorhynchid acanthocephalans are typically parasites of mammals; to our knowledge no species reaches maturity in reptiles; but cystacanths are frequently found embedded in tissues. Species of acanthocephalans require an arthropod host (Schmidt, 1985). Bolette (1997) suggested that reptiles may serve as paratenic hosts.

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